

NASA TECH BRIEF



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Improved Adhesive for Cryogenic Applications Cures at Room Temperature

The problem:

To formulate an adhesive that will cure at room temperature and provide an effective adhesive bond over the range from room temperature down to the temperature of liquid hydrogen (-423°F).

The solution:

An adhesive consisting of 1 part of 200-mesh powdered nylon filler to 2 parts of an epoxy-polyamine resin.

The added nylon filler markedly improves the adhesive strength (tensile shear) and adhesive toughness (T-peel strength) of the epoxy-polyamine resin. The filled adhesive can be cured at room temperature, whereas the unfilled resin requires a 250°F curing cycle. When applied to 7075-T6 bare aluminum, the bond strengths of the filled and unfilled adhesives cured under contact pressure at room temperature are as follows:

Adhesive	Tensile Shear (Psi)			T-Peel (Lb/in.)		
	Rm Temp.	-320°F	-423°F	Rm Temp.	-320°F	-423°F
Unfilled Epoxy-Polyamine	2334	1514	1552	0	0	0
Nylon-Filled Epoxy-Polyamine	3127	2710	2552	3.9	3.5	3.0

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Western Operations Office
150 Pico Boulevard
Santa Monica, California, 90406
Reference: B66-10185

Patent status:

No patent action is contemplated by NASA.

Source: M. B. Smith and Harry J. Klinger
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under contract to
Western Operations Office
(WOO-132)

Category 03

